The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HIROJI TANI AND KEISUKE NAGATA

Appeal No. 1998-0773
Application No. 08/578,106

HEARD: FEBRUARY 21, 2001

Before GARRIS, TIMM, and PAWLIKOWSKI, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 2-7, 9 and 10, which are all of the claims pending in this application.

THE INVENTION

Appellants' invention relates to a resistive paste and a method of producing a resistor by applying the resistive paste to a substrate and firing. The paste includes a solid component in an organic vehicle. The solid component contains a mixture of 5-65 wt% resistance material and 35-95 wt% non-reducible glass frit. The resistance material has a formula of $Ca_xSr_{1-x}RuO_3$, wherein x is 0.25 to 0.75 moles. Claim 2 is illustrative:

> 2. A resistive paste comprising an organic vehicle and a solid component comprising from about 5 to 65 % by weight of resistance material having a composition of the formula:
>
> $$Ca_xSr_{1-x}RuO_3$$
>
> wherein x is from 0.25 to 0.75 moles and from about 35 to 95 % by weight of a non-reducible glass frit.

THE REFERENCES RELIED UPON

The prior art references of record relied upon by the Examiner in rejecting the appealed claims are:

Hankey	4,536,328	Aug. 20, 1985
Wu et al. (Wu)	5,470,668	Nov. 28, 1995

THE REJECTION

Claims 2-7, 9, and 10 stand rejected under 35 U.S.C. § 103 as being unpatentable over Hankey in view of Wu.[1]

OPINION

We have reviewed the respective positions presented by Appellants and the Examiner. In so doing, we find ourselves in agreement with Appellants that the applied prior art fails to establish a *prima facie* case of obviousness with respect to the subject matter of the claims. Accordingly, we reverse the Examiner's rejection for essentially those reasons advanced by Appellants, and we add the following primarily for emphasis.

In *In re Kotzab*, the Federal Circuit noted that:

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field.
>
> * * *
>
> Most if not all inventions arise from a combination of old elements. Thus, every element of a claimed invention may often be found in the prior art. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant.

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[1] A rejection under 35 U.S.C. § 112, second paragraph was withdrawn by the Examiner after the final rejection (Answer, page 5).

In re Kotzab, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000) (citations omitted).

In the present case, using the Appellants' description of their invention as a guideline, it is possible to pick out the various chemical constituents of the claimed composition from the prior art. However, we cannot agree that the prior art alone would have provided sufficient guidance to have made it obvious to one of ordinary skill in the art at the time of invention to select those particular constituents and make the combination made by Appellants. In particular, we are doubtful that one of ordinary skill in the art would have looked to the teachings of Wu in order to select a resistance material for use in the composition of Hankey with a reasonable expectation that the chosen material would have the properties desired by Hankey.

Hankey describes an electrical resistance composition containing a conductive metal oxide component (col. 2, line 67 to col. 3, line 5), a binder made of fritted glass (Example 1), and an organic vehicle (col. 5, lines 12-13). The Examiner and Appellants agree that the conductive metal oxide of Hankey is not the same as that recited in the claims (Answer, page 4; Brief, page 5). For instance, the level of Sr is required to be at least 0.8 moles while the level of Ca is required to be less than 0.2 moles whereas the claim requires the levels of Sr and Ca to be between 0.25 and 0.75 moles.

Hankey describes combining the conductive component, binder component and organic vehicle to form a paste (col. 5, lines 38-41). The paste is screen printed onto copper present on a ceramic substrate and then fired in a nitrogen atmosphere (col. 5, lines 32-37). The object is to provide a stable copper compatible resistance composition that can be fired in non-oxidizing atmospheres (col. 2, lines 57-59) and provide a thick film resistor system which exhibits property reproducibility and reduced processing sensitivity (col. 2, lines 60-63).

Wu teaches thin layers, especially epitaxial thin layers, of a conductive mixed alkaline earth metal oxide of formula $Sr_{1-x}Ca_xRuO_3$, where x is from 0 to 1 (col. 2, lines 20, 21, and 43-44). The Examiner and Appellants agree that the generic formula of Wu encompasses the resistance materials of the claim (Answer, page 4; Brief, page 6). Wu deposits the conductive metal oxide using pulsed laser deposition or by methods such as evaporation or sputtering, on a noble metal such as platinum, to form a composite electrode structure or a buffer or intermediate layer between the metal film or substrate and a subsequently deposited oxide material (col. 2, lines 19-38, col. 3, lines 49-59).

What we notice is that Wu is not directed to solving the same or a similar problem as Hankey. Wu is not concerned with stability of the metal oxide conductive material when used in a <u>thick film paste</u> deposited on copper; nor is Wu interested in property reproducibility and processing sensitivity in such a <u>thick film paste</u>. What is lacking is a reasonable expectation that the mixed alkaline earth metal oxide

compositions described by Wu could have been successfully used in the resistance composition of Hankey or that one of ordinary skill in the art would have reasonably expected that inclusion of the mixed alkaline earth metal oxides of Wu would have resulted in stable copper compatible resistance compositions in the environment of Hankey.

The Examiner points out that Wu describes alkaline earth metal oxides as generally having resistivities of about 10 to 20 times those of copper. The Examiner concludes that it would have been obvious for one skilled in the art at the time the invention was made to have substituted Wu's resistive material for Hankey's resistive material because one skilled in the art would have wanted to obtain a more resistive paste as evidenced by Wu (Answer, page 4). There is no evidence that the metal oxides of Wu are more resistive than the metal oxides of Hankey. While we acknowledge that Wu teaches that the alkaline earth metal oxides generally have resistivities of about 10 to 20 times those of copper, this fact alone does not provide a reason, suggestion, or motivation to use the mixed alkaline earth metal oxide in place of the other alkaline earth metal oxides which Hankey describes as being copper compatible, stable, reproducible and less subject to processing sensitivity in thick film resistor paste systems. At best, it might have been reasonable for one of ordinary skill in the art to experiment with the mixed alkaline earth metal oxide. However, neither Hankey nor Wu provide any reason to believe that the stability, reproducibility and sensitivity would be the same or better with the mixed alkaline earth metal oxide.

"[T]he examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed."

In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998). Those reasons are lacking in the present case. Therefore, we conclude for the above reasons and those presented by the Appellants that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of the appealed claims.

CONCLUSION

To summarize, the decision of the Examiner to reject claims 2-7, 9 and 10 under 35 U.S.C. § 103 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

REVERSED

BRADLEY R. GARRIS Administrative Patent Judge	)	
CATHERINE TIMM Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
BEVERLY A. PAWLIKOWSKI Administrative Patent Judge	)	

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